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the contents of the volume have been much increased without adding seriously to the size of the volume. The references, which made so valuable and novel a feature of the original work, are also extended, and include material as fresh as the results of Peach's and Horne's studies in the Scotch Highlands, which are alluded to with admirable frankness, although going so counter to the author's earlier work and opinions. The wonderful epitome of historic geology presented in Great Britain renders illustrations from other countries much less necessary than they would be in any other region of the same area, so that the work is essentially and intentionally British in character; but the general discussions of the first two-thirds of the volume make it a standard of reference wherever geology is studied. Mentions of progress in this country are necessarily brief, but they are well chosen and appreciative, from Whitney and Wadsworth's 'Azoic system,' which is characterized as a 'full and pungent discussion,' to Chamberlin's report on the 'Terminal moraine,'—an 'admirable summary,' with which every student of glacial geology ought to make himself familiar.

The second volume of Günther's 'Geophysik' (Stuttgart, *Enke*, 1885) follows soon after the first, which was lately noticed in *Science*. The contents are, 'Terrestrial magnetism,' 'Atmospherology,' 'Oceanography,' and the unnamed physical study of the dry land. As in the first volume, the form of treatment embraces a history and discussion of every important question, with liberal references to the literature of the subject. Under many headings the discussion is necessarily brief, and serves hardly more than to open and close the question, without occupying a middle ground concerned with details of fact; but elsewhere, when dealing with matters in which scientific discussion is still active,—as the aurora, the colors of the sky, hail, sun-spot cycles, variation of sea-level, and others,—there is fuller consideration. The two volumes show a reading of most extraordinary breadth and critical power, and form a compendium that must be indispensable to teachers and advanced students.

Dr. Partsch has completed a work begun by his teacher and predecessor, Dr. Neumann; and the result of their joint labors makes a comprehensive handbook on the physical geography of Greece. Explorations in late years by Austrian geologists, have given much material for the description of its structural history, and the climatic chapter is made thorough by aid from Dr. Hann of Vienna. Santorin

receives a full account, although active volcanoes were not known in Greece at the time of its ancient flourishing. Earthquakes, on the other hand, have always been common, and the more important ones are described. Modern chronicles show certain periodicities in the occurrence of Grecian earthquakes; and this makes the loss of the ancient catalogue by Demetrius of Callatis all the more regrettable. Forel's ingenious explanation is quoted for the puzzling currents of Euripos; the six-hour currents at time of new and full moon depending on the tides from the larger basin to the south, the two-hour currents at time of lunar quadratures arising from the gentle oscillations (*seiches*) of the smaller basin on the north. A work of this monographic character is as interesting a task as the student can set before him. It brings him a wide range of acquaintance with writings on subjects allied to those he discusses, and in turn introduces him to a larger circle of readers than is attracted by most authors; and this is especially true when the task has been so well performed as in the volume before us. It is as useful to classical scholars and historians as to geographers and naturalists.

INFECTIOUS DISEASES.

THE recent rapid revolution in medical theories regarding the nature of a large group of diseases, has made antiquated the books which only a short time ago were quoted as high authority. A new text-book, therefore, by so able and polished a writer as Professor Liebermeister, must be a welcome contribution to the library of every medical student. The first volume is devoted to that group of diseases upon which is riveted the attention of all sanitarians, as well as physicians, at the present time. It deals with the infectious diseases, and the story of the hidden mysteries of this strange world of minute germs is told in a fascinating manner.

The word infection was originally applied to every form of poisoning; but it is now restricted to the pollution of the body by a special kind of poison, which has the property of reproduction and self-multiplication to an indefinite degree under favorable conditions. This power of multiplication has long been recognized in certain diseases, and has in former times led to the suspicion that the poison of those diseases consisted of particular living entities; and recent investigations have

Vorlesungen über specielle pathologie und therapie. Von Dr. C. LIEBERMEISTER. Leipzig, Vogel, 1885. 8°.

proven to an absolute certainty that small, microscopic organisms, called micrococci, bacteria, schizomycetes, etc., are the sole cause and essence of a large number of diseases, and that without these organisms present in the body such diseases are impossible. It seems queer, that among all the mystical, visionary theories of disease imagined by the poetical fancies of the ancients, one theory, most visionary and fairy-like of all, should to-day become the established creed of sceptical science. The idea that minute organisms, visible only by certain devices of the microscopist, should invade our bodies, and, there selecting their appropriate abodes, should, by rapid multiplication, become the cause of typhoid-fever, small-pox, diphtheria, consumption, and numerous other diseases, seems like a fable; and yet such is the truth. The casting out of evil spirits is not wholly a figure of speech, and heathen incantations and the beatings of drums were but the earliest attempts to solve the problem of dislodgement which is pressing us hard at the present day.

In the introductory pages of his work, Professor Liebermeister defines and classifies the different varieties of infectious diseases in a very clear manner. He first divides those diseases into the miasmatic and the contagious. By miasmatic, he designates those diseases whose germs are primarily generated outside of, and independently of, any diseased body. Contagious diseases are those whose specific germs arise only in organisms suffering the special diseases. Contagious germs can be transferred from a sick man directly to a well man by simple contact, and they may then produce the same disease in this second person. Miasmatic germs, however, are bred in special localities, — in the soil and water, — and they attack those who come to these localities, but are not transferable from person to person. The contagious diseases, therefore, are *epidemic*; the miasmatic, *endemic*. A third group of these diseases includes a number whose germs appear to require two stages of development—first in the body, and then outside of it—before they become qualified to infect a new body. Thus cholera is not directly transferable from person to person, and men are also attacked who never saw another sick with cholera. On the other hand, it is equally certain that cholera never arises in any place outside of the East Indies, except it is brought to that place by human agency. Professor Liebermeister's explanation of these apparently contradictory facts is very logical and satisfactory. He assumes that cholera germs,

when first expelled from a diseased body, are innocuous; but, falling upon suitable conditions of temperature and moisture, they develop the fatal properties which render them deadly to those who then come in contact with them. Typhoid-fever exhibits similar contradictions as regards its methods of transmission, but such contradictions become clear and harmonious in the light of this theory. The excrement of one typhoid-patient in Pennsylvania, thrown out upon the hillside to ripen its deadly poison, killed hundreds of people in the town of Plymouth a few weeks later. The necessity for the instantaneous disinfection of all the excreta of these diseases should be one of the fundamental principles of sanitation taught to every child in every school in the land. Grown-up people do not go to school, and they learn slowly. Children at the right age should be taught such matters in the proper way.

In his handling of special diseases, Professor Liebermeister is short and terse, but remarkably clear; and we most cordially recommend his work to all.

NOTES AND NEWS.

—The 'Journal of the Franklin institute' for October adds another series of composite photographs to the fast-increasing contributions in this field. They group together the historic portraits of Washington, as represented by seventeen artists. There are three composites in all, due to the variations of position in the originals; and the resemblance of the three to one another is stronger than the resemblance amongst the originals. The photographs were prepared by Mr. W. Curtis Taylor of Philadelphia, who claims for them the highest attainable accuracy. A large crayon drawing of one of the composites is exhibited at the 'Novelties exhibition' in Philadelphia.

—Dr. Heinrich Winkler, in his recently published 'Uralaltaische völker und sprachen,' has made a careful comparison of the Eskimo with the languages of northern and north-eastern Asia. He reaches the result that it is in unmistakably close relation to the Kadyak, Tschiglit, and Namollo of the Asiatic coast, but is in no way connected with the Ural-Altaic tongues. It may have originally proceeded from the same elementary conception of speech; but it has developed a type of its own differing widely from Asiatic standards, and much more closely approaching the structure typical of the great mass of American tongues, though in many respects presenting features peculiar to itself.

—An aerostatic school is to be established at Grenoble in connection with the artillery, and will be especially devoted to teaching the use of captive balloons in reconnoitring.